



THE
ONTARIO WATER RESOURCES
COMMISSION

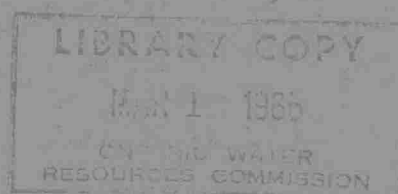
WATER POLLUTION SURVEY

OF THE

TOWN OF WALKERTON

COUNTY OF BRUCE

1964



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R E P O R T

on

WATER POLLUTION SURVEY

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TOWN OF WALKERTON

COUNTY OF BRUCE

Date of Sampling: - October 1, 2, 1964

Division of Sanitary Engineering

R E P O R T

ONTARIO WATER RESOURCES COMMISSION

A water pollution survey was carried out in the Town of Walkerton on October 1, 2, 1964 in an effort to locate and evaluate domestic and industrial sources of pollution. Such surveys are carried out routinely and upon request by the Division of Sanitary Engineering of the Commission as a basis for determining water supply and sewage treatment requirements.

The field work for the survey was undertaken on October 2nd, a warm sunny day with the temperature in the low 60's. Samples taken were submitted to the OWRC Laboratory in Toronto for analysis.

I GENERAL

The Town of Walkerton is located on the Saugeen River in the south-east corner of the County of Bruce. The population of the town according to the 1964 Municipal Directory is 4,069 and the taxable assessment is approximately \$4.3 million.

Walkerton is the county seat and the largest municipality in the county. The economy of the town centres around a substantial industrial base and supporting retail services.

II WATER USES

1. Municipal Water System

The municipal water supply is drawn from three deep drilled wells with a total pumping capacity of 1020 gpm. The Commission's latest report on the water works indicates that the daily pumpage

averages close to one-half million gallons. Hardness and iron concentrations in the water are distinct problems not only with respect to taste and odour but from an economic standpoint as well.

Regular sampling of the water supply by the county health unit staff has disclosed periodic problems of contamination in the system. Most of such contamination has been traced to "cross connections" which are illegal plumbing connections between the municipal and private supplies; the latter being rain water cisterns with a much softer water than the town supply. It is estimated that 70% of the population of the town depends on such a secondary source of water. Such a situation constitutes a significant public health hazard.

Since the municipality has no plumbing inspection service, further contamination of the municipal supply in the future is quite probable. In such a case, it may become necessary to provide chlorination at the sources of supply.

2. Industrial Water Supplies

The town's industries all utilize the municipal water supply. Two, are large consumers namely Canada Packers with a daily average consumption of 60,000 gallons and Larsen and Shaw Limited who require approximately 20,000 gallons per day.

3. Recreational Uses

Very little use is made of the river in the vicinity of the town for recreational purposes. Fishing, boating and swimming are

practised to a limited extent above the dam in the upstream (south-east) portion of the town.

III WATER POLLUTION

1. Sanitary Waste Disposal

(a) Existing Conditions

A system of combined sewers serves almost the entire section of the town to the south and west of the Saugeen River. To the east of the river, domestic sewage is collected by a system of sanitary sewers which are connected to a 24" storm sewer. In addition to the foregoing, there are a number of private sewers.

All of these sewers discharge untreated wastes to the Saugeen River. Samples of the effluent from six sewers were secured for laboratory analysis along with samples of the river above and below the town.

The Saugeen River is particularly susceptible to flooding during the spring thaw. Such flooding frequently causes the combined sewers in the downtown (Durham St.) section to back-up resulting in a significant health hazard.

(b) Proposed Sewage Works

In 1946, the firm of Proctor and Redfern, Consulting Engineers, submitted a report to the town council outlining a system of sewers which would be incorporated with a primary sewage treatment plant. No action was taken by the town council.

In 1962, the Commission staff undertook a study on the feasibility of a sewage lagoon or waste stabilization pond as an alternative to a treatment plant. The construction of a lagoon in the river valley north of the town was considered practical at that time.

Early in 1964, council of the Town of Walkerton again requested a consulting engineer's report on a sewage disposal system. This report, being prepared by R. V. Anderson & Associates, is expected early in 1965.

2. Industrial Waste Disposal

There are a number of moderate sized industries in the town, the majority of which present no significant problem with respect to abnormal or noxious wastes. Two firms, however, produce trade wastes of such a nature that their volume and content would be of concern in the design of any sewage works programme. The discharge of these wastes to the river at present is a serious pollution problem. The firms and details of their production are as follows.

(a) Canada Packers Limited

This firm operates an egg washing plant and what is reported to be the largest poultry killing operation in Canada. The plant operates five days per week and processes 100,000 lbs. of poultry per day with, as noted earlier, a daily water consumption of 60,000 gallons.

While the plant is equipped to remove solid particles from the waste discharge, an excessive volume of discarded poultry parts reaches the municipal sewer system. Feathers, blood, and offal were

found in the effluent from two large sewer outlets and in a one-half mile stretch of the river. In addition, the accumulation of such wastes in the sewer system resulted in the back-up of adjacent sewers during the survey.

(b) Larsen and Shaw Limited

This company manufactures hardware items for the furniture trade and as such, performs several plating processes. Nitric, sulphuric, chromic acids and cyanide compounds are used in moderate volume and the resultant waste products, even in diluted form, are cause for concern.

3. Refuse Disposal

The town maintains a refuse disposal site at the north limits of the municipality. Wastes are dumped on a high bank overlooking the Saugeen River and have reached a depth of 70 feet. The base of the dump is approximately 100 feet from the river and there is evidence of wastes and leachate reaching the river. Such a condition is unsatisfactory and the use of the south portions of the dump site would eliminate the pollution of the river from this source.

4. Discussion of Sample Analyses

The sampling portion of this survey involved only a fraction of the total number of outlets to the river. It does, however, include the major volume of wastes from municipal sewer outlets and is a fair representation of the extent of pollution from these sources.

The samples were submitted for bacteriological and sanitary

chemical analyses and, in two instances, specific chemical determinations were made. The results of the various analyses are attached. A brief outline of the interpretation of the results is as follows.

Biochemical Oxygen Demand (BOD)

The BOD is an indication of the amount of oxygen required to stabilize the decomposable organic matter present. The OWRC objectives for waste discharges and natural waters are not greater than 15.0 ppm and 4.0 ppm respectively.

Suspended Solids

The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams, and injury to the habitat of fish. For waste discharges, the Commission objective is a concentration not in excess of 15.0 ppm.

M.F. Coliforms per 100 ml

The Membrane Filter (MF) test for coliform organisms is used to indicate the presence of waste from the intestinal tract of humans and warm-blooded animals. A stream or watercourse sample which exceeds 2,400 per 100 ml indicates excessive domestic pollution and the possible presence of disease-producing bacteria.

Cyanide as HCN and Chrome as Cr

These two substances are generally found in waste discharges from plating operations. The suggested limits for concentrations in discharges to watercourses are 0.1 ppm and 1.0 ppm respectively.

Discussion of Results

The results of analyses on samples number 1, 4 and 9 reflect the condition of the river as it reaches the dam upstream and the degradation in water quality in its passage through the town. The sample taken downstream (No.9) represents a stream water which does not meet OWRC objectives.

Each of the samples of effluent from the various sewers indicates excessive bacterial pollution, and, in most cases, an exceedingly high content of organic material. Chemical analyses of samples from the Queen St. and Catharine St. sewers reveal the presence of undesirable industrial trade wastes. The cyanide content, in particular, exceeds the recommended limit for such material.

IV SUMMARY AND CONCLUSIONS

A water pollution survey of the Town of Walkerton was carried out on October 1, 2, 1964. The results of the survey indicate that pollution of the Saugeen River from domestic and industrial sources through a system of municipal sewers is extensive. Industrial wastes from the Canada Packers Limited plant and from Larsen and Shaw Limited are a serious problem.

In addition, the municipal water supply was found to have been contaminated on numerous occasions in the past few years. This condition appears to have been caused by improper connections between the municipal system and private water supplies. Such connections

could be controlled through the initiation of plumbing inspection services.

V RECOMMENDATIONS

It is recommended that:

(a) Officials of the Town of Walkerton be strongly urged to undertake a sewage works programme at the earliest possible date.

(b) Canada Packers Limited undertake such measures as are required to prevent the discharge of poultry offal to the municipal sewer system.

(c) Larsen and Shaw Limited arrange for the treatment of trade wastes to prevent the discharge of dangerous chemical substances to the sewer system and hence, to the river.

(d) Action be taken at an early date, to sever all connections between the municipal and private water systems and to institute a plumbing inspection service in the town. This service could well be provided on a county basis.

All of which is respectfully submitted

District Engineer


A. B. Redekopp

Approved by


K. H. Sharpe, Director

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TABLE I

TOWN OF WALKERTON

<u>Sampling Pt. No.</u>	<u>Location</u>	<u>5-Day BOD</u>	<u>Total</u>	<u>Solids Susp.</u>	<u>Diss.</u>	<u>Cyanide as HCN</u>	<u>Chrome as Cr.</u>	<u>Coliforms per 100 ml</u>
1	Saugeen R. at dam - upstream	1.6	468	2	466			380
2	Orange St. sewer - effluent	105	1976	37	1939			420,000
3	Private 15"Ø drain outlet - S. of Durham St.	15	786	20	766			1,330,000
4	Saugeen River at Durham St.	2.4	490	2	488			700
5	Catharine St. sewer - (submerged) - at Victoria St.	4.4	520	2	518			2,400,000
6	Gibson St. sewer - (submerged)	185	1452	154	1298			43,000,000
7	Catharine St. sewer at Peter St.	560	2396	284	2112	0	0.04	1,360,000
8	Queen St. sewer	260	1442	146	1296	0.5	0.0	5,600,000
9	Saugeen R. - 300 yds. downstream from Queen St.	5.6	494	6	488			67,000

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